Wetland distribution in eastern South Dakota

Eastern South Dakota wetlands were formed by retreating glaciers, so wetlands tend to be most common in areas covered by the last glaciers. The landscape of eastern South Dakota is geologically too young for rivers and streams to be well developed. About 80% of the landscape in many areas of eastern South Dakota drained into wetlands before European settlement.

Watershed size and terrain, average annual precipitation and evaporation, soil type, and ground water interactions all determine a wetland's water permanence (water regime).

High-relief landscapes with deep depressions, sometimes called knob-and-kettle terrain (as in parts of Marshall County), often contain many semipermanent wetlands. Shallow temporary and seasonal wetlands are usually most abundant in low-relief terrain like that in Beadle, Spink, and Brown counties.

Eastern South Dakota counties, permanent wetlands, and rivers.

Natural wetlands

The 520,379 **temporary** wetlands in eastern South Dakota cover just over 390,000 acres. They are the most common type of wetland in the region, making up 55% of the total number of wetlands.

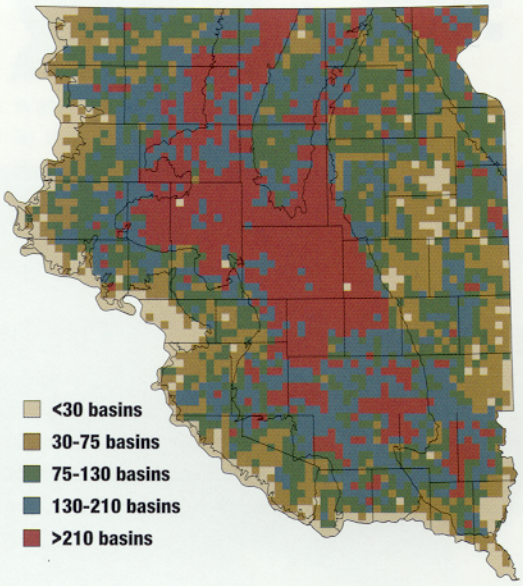
Temporaries are most common in Beadle, Brown, Spink, and Hand counties where their combined number is over 146,000. Temporaries are least common outside the area covered by the last glaciers, such as in Buffalo and Union counties where they total only about 4,300.

About 77%, or 399,000 temporary wetlands, are in cropland. Location, coupled with ease of drainage, makes them vulnerable to loss.

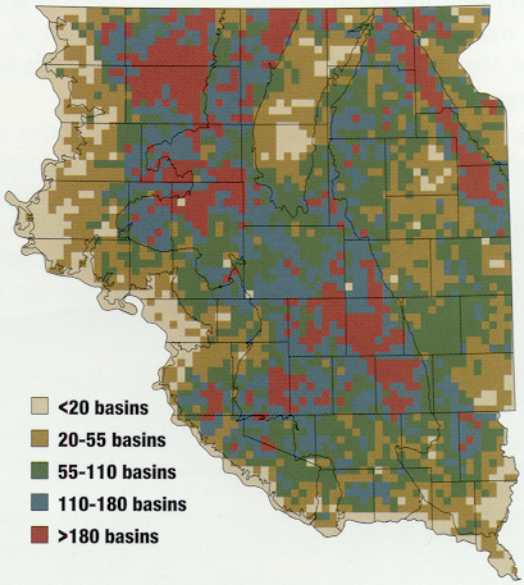
A total of 334,699 **seasonal** wetlands in eastern South Dakota cover over 553,500 acres. They are abundant in scattered localities, but are particularly common in an 80 mile-wide band that runs diagonally from Eureka in McPherson County southeastward to Salem in McCook County.

Edmunds County alone contains 22,225 seasonal wetlands. The fewest seasonals—only 998—are found in Union County.

Number of temporary wetlands/10mi^2.



Number of seasonal wetlands/10mi^2.



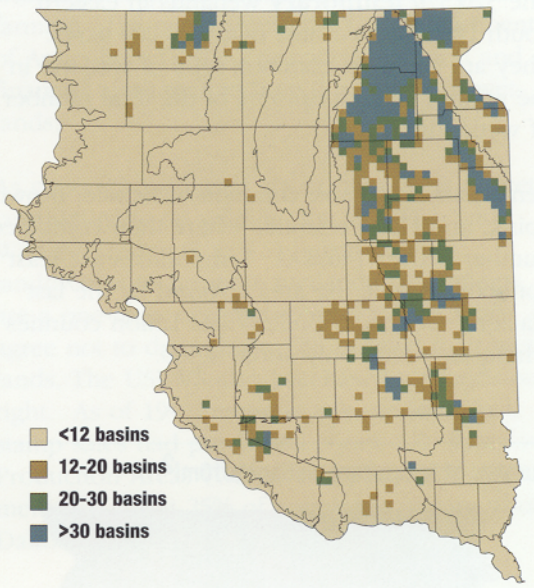
A temporary wetland filled by runoff from melting snow. Without rain, this wetland will be dry within a few weeks after the soil thaws. Until then it may provide habitat for ducks and shorebirds.

Semipermanents, with their typical mix of cattails and open water, are what first comes to mind when many people picture "wetlands." Actually, semipermanents are uncommon—they number only 23,997 and occupy about 377,600 acres. All together, they make up only about 2.5% of all wetlands in eastern South Dakota.

Semipermanents are most often found in a few areas of northeastern South Dakota including the counties of Marshall, Day, Roberts, Grant, and Deuel. The number of semipermanents in these counties total 11,828—almost half the total number of all semipermanents in eastern South Dakota. The smallest number of semipermanents, 22, occurs in Hughes County.

Permanent wetlands are the least common type of natural wetlands; there are only 603 east of the Missouri River. However, these wetlands are large and cover over 194,000 acres.

Number of semipermanent wetlands/10mi^2.



Semipermanent wetland in summer

The highest density of large permanent wetlands (lakes) occurs along the west side of the Big Sioux River from Day County south to Lake County. Lake Poinsett in Brookings and Hamlin counties, at 10,100 acres is the largest natural permanent wetland in South Dakota.

Sometimes large semipermanent wetlands fill up and function as lakes, but the water eventually recedes and they once again become dominated by cattails or similar vegetation, something that rarely happens to lakes. Lake Thompson in Kingsbury County is a good example. It has repeatedly filled up and then dried up in the past. In the mid-1980s and 1990s Lake Thompson swelled to nearly 20,000 acres, making it the largest natural "lake-like" body of water in the state. Although the changes are usually not as dramatic, small wetlands also are very dynamic.

Rivers cover about 69,300 acres of eastern South Dakota. The major rivers in eastern South Dakota are the Big Sioux, Vermillion, James, and Missouri. Creation of the Missouri River reservoirs destroyed much of the riverine habitat in eastern South Dakota by changing those river reaches to impoundments. Some free flowing reaches still exist, bordering Charles Mix, Bon Homme, Yankton, Clay, and Union counties, but even in these areas the natural hydrology has been greatly altered because dams control the flow of water.

Rivers in the glaciated prairie pothole region tend to be narrow with weakly developed channels. Consequently they tend to be flood-prone when snow melts quickly or after heavy rains.

The Big Sioux River was once nick-named the "Silvery Sioux." In 1838, Joseph Nicollet described the Big Sioux near Brookings as "a stream of clear, swift-running water" flowing over a "pebbly bottom." Only rivers that flow mainly through pastureland—like the Yellowbank River in Grant County—still fit this description.

Healthy riverine habitats often have high biodiversity. Although flowing freshwater comprises only about 1/1 millionth of all the water on earth, 50% of all animal species inhabit creeks, streams, and rivers. In fact, one of the best ways to evaluate the health of a river is to sample its invertebrates.

The Yellowbank River in Grant County

Created wetlands

Created wetlands are usually constructed in one of two ways: by excavating a hole or channel or by blocking the natural flow of water with a dam, thereby creating an impoundment.

The only types of excavated wetland discussed in this report are **dugouts**—rectangular holes dug to intercept surface runoff or to expose the water table. Generally dugouts are constructed to provide water for livestock. A total of 56,827 dugouts are scattered across eastern South Dakota, of which 35,086 (62%) were excavated in 22,530 natural wetlands. The remaining 21,741 dugouts were constructed outside of natural wetlands or in stream channels.

Although dugouts may occasionally enhance natural wetlands by providing a deep-water refuge for duck broods or fish, their impact may be negative when spoil from the excavation is piled in the natural wetland.

Eastern South Dakota **impoundments** may be subdivided into two broad groups; (1) small impoundments, often called stock dams, and (2) large (more than 100 acres), permanent reservoirs. All impoundments are constructed by creating a dam in a channel. Consequently, most are found on or near the Missouri River, outside areas of recent glaciation.

Dugout in a natural wetland

Although the technology of damming up a ravine or intermittent stream to create a stock dam is superficially like that of creating a large reservoir on a mainstem river or major tributary, the results for landowners and wildlife are very different. Both types of constructed wetlands can effectively impound runoff; however, livestock and wildlife relate to the shoreline of an impoundment, making little or no use of the center of these bodies of open water. Stock dams typically have much greater shoreline length relative to their size than do large reservoirs. Therefore, small stock dams provide greater benefits to landowners and wildlife than does a single large reservoir of the same total area.

Some stock dams provide added benefits of recreational fishing. Stock dams also may enhance cattle performance by improving stock distribution and range and pasture utilization. Several federal agencies offer cost sharing and technical assistance for creating these kinds of wetlands.

In eastern South Dakota, most stock dams are a few acres in size and have a 200-600 acre watershed. Most contain between 12 and 20 acre-feet of water when full. A total of 11,836 stock dams have been constructed in eastern South Dakota covering 106,740 acres.

Large reservoirs are permanent impoundments constructed for flood control, hydroelectric power generation, domestic or agricultural water supplies, or for recreation. The 75 reservoirs in the region cover 256,826 acres, or about 12% of the total area of surface water in eastern South Dakota. This total acreage includes the area of Missouri River reservoirs within the counties on the east side of the river.

Approximately 95% of the reservoir area in eastern South Dakota is made up by lakes Lewis and Clark, Francis Case, Sharpe, and Oahe on the Missouri River.